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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,178	10/02/2003	Stefan Schneidewind	A36021	8326

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EXAMINER	
HOLLINGTON, JERMELE M	

ART UNIT	PAPER NUMBER
2829	

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/677,178	SCHNEIDEWIND ET AL.	
	Examiner	Art Unit	
	Jermele M. Hollington	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6 and 8-12* is/are rejected.

7)☒ Claim(s) *5 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, through opening provided with a transparent closure [claim 4] and a chuck comprising chuck body with a chuck surface and chuck plate [claim 9] must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: on page 1, paragraph [0001], line 2, the co-pending application Serial Number is not listed. On page 11, paragraph [0036], line 5, "the probe holders 24" should be change to --probe holders 19--.

Appropriate correction is required.

Claim Objections

3. Claim 11 is objected to because of the following informalities: at the very end of the claim change the comma to a period. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3-4, 6, 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (5775416) in view of Vosen (5930456).

Regarding claim 1, Heimanson et al disclose [see Figs. 1 & 2] a test apparatus [see **Note** below] comprising: a vacuum chamber (vacuum chamber 12); an uncooled chuck drive (vertical drive 108) arranged within said vacuum chamber (12); a chuck (chuck 20) carried by said chuck drive (108) [see col. 4, line 45] and thermally decoupled therefrom, said chuck (20) having a receiving surface (cavity 30) for receiving a test substrate (wafer substrate 18), a substrate carrier (annular seat 22) for receiving and holding a substrate (18) to be tested in releasable thermal contact with said receiving surface (30). However they do not disclose a thermal radiation shield as claimed. Vosen discloses [see Fig. 1] a test apparatus (system 10) comprising a vacuum chamber (chamber 12) [see also col. 5, lines 62-63], test substrate (wafer 14), a substrate carrier (substrate holder 15) and a directly cooled thermal radiation shield (window 32) arranged to shield said test substrate (14) from thermal radiation [see col. 6, lines 62-66]. Further, Vosen teaches that the addition of thermal radiation shield is advantageous because prevents thermal radiation and contamination from entering the chamber and to prevent a direct path from a light source to sensing port on the substrate. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Heimanson et al by adding thermal radiation shield as taught by Vosen in order to prevent thermal radiation and contamination from entering the chamber as well as to prevent a direct path from a light source to sensing port on the substrate.

[Note: The recitation "for testing substrates at low temperatures" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not

depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).]

Regarding claim 3, Heimanson et al disclose said chuck (20) is connected to said chuck drive (108) by means of an intermediate part (chuck body 56) made from a material with a lower thermal conductivity than metal.

Regarding claim 4, Vosen discloses said thermal radiation shield (32) has a through opening in the center.

Regarding claim 6, Heimanson et al disclose there are provided probe holders (clamp 52), which are thermally conductively connected to the chuck (20).

Regarding claim 8, Heimanson et al disclose said substrate carrier (22) is carried by a mounting arrangement (clamp 32) which includes a vertically movable member which is thermally connected to the cooled chuck (20), and a holding pin [not number but shown in Fig. 2], which is mounted to the chuck drive (108) [via chuck body 56] and consists of a material with a lower thermal conductivity than metal.

Regarding claim 9, Heimanson et al disclose the chuck (20) comprises a chuck body (chuck body 56) with a chuck surface (plate 36b) and a chuck plate (plate 36a), which rests on the chuck surface over its entire area and can be detached from the chuck body (56).

Regarding claim 10, Heimanson et al disclose cooled parts (cooling unit 34) of the chuck (20) and of the thermal radiation shield (32 of Vosen wherein the cooled parts are cooling conduits 16) consist of material with a good thermal conductivity, and the cooled parts (34) of the chuck (20) have highly reflective surfaces.

Regarding claim 11, Heimanson et al disclose the chuck (20) has a chuck heater (heating unit 24).

Regarding claim 12, Vosen discloses the thermal radiation shield (32) has a shield heater (heating device 22) [see col. 6, lines 8-27].

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al in view of Vosen as applied to claim 1 above, and further in view of Hollman (6198299).

Regarding claim 2,Heimanson et al and Vosen both disclose said vacuum chamber (12 of both references). However, they do not disclose vacuum chamber with an inspection opening as claimed. Hollman discloses [see Fig. 2] a test apparatus (system 10) comprising chuck drive (combination of x-y prober platform 46 and x-y stage 17), a chuck (wafer chuck 14) carried by said chuck drive (46 and 17), a substrate carrier (shown but not numbered in Fig.) for receiving and holding a test substrate (DUT 50) and a vacuum chamber (vacuum chamber 26) with an inspection opening (not numbered but shown in Fig.) on top wall (chamber top 28) lying opposite a top side of said chuck (14). Further, Hollman teaches that the addition of vacuum chamber with an inspection opening is advantageous because it helps any type inspection equipment (such as scanning probe microscope) to observe a surface of the device under test for identifying the electrically conductive terminals for the positioning of probes. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Heimanson et al in view of Vosen by adding an inspection opening to the vacuum chamber as taught by Hollman in order to observe a surface of the device under test for identifying the electrically conductive terminals for the positioning of probes.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yokoi et al (4692694), Harwood et al (5266889), Amemiya (6169409), Kanao et al (6194907) and Lo et al (6344750) disclose a method and apparatus wafer testing inside a chamber.

Guardado et al (6222990), Dean et al 96538440), Kellerman et al 96735378), and Gat et al (6771895) disclose a method and apparatus of using a thermal shield and other heating devices in a vacuum chamber.

9. Claims 5 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: regarding claim 5, the primary reason for the allowance of the claim is due to a through opening in a thermal radiation shield having a transparent closure that filters light of selected wavelengths.

Regarding claim 7, the primary reason for the allowance of the claim is due to probe holders in a vacuum chamber that are thermally conductively connected to the thermal radiation shield.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermele M. Hollington whose telephone number is (571) 272-1960. The examiner can normally be reached on M-F (9:00-4:30 EST) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (517) 272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jermele M. Hollington
Patent Examiner
Art Unit 2829

JMH
February 4, 2005